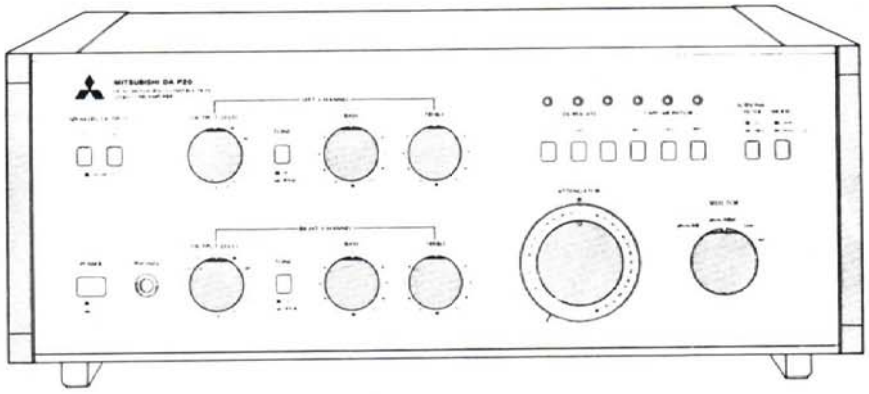
MITSUBISHI
AUDIO SYSTEMS

SERVICE MANUAL

STEREO PREAMPLIFIER

MODEL DA-P20



CONTENTS

MITSUBISHI ELECTRIC CORPORATION

SERVICE DATA

Input sensitivity/Impedance

PHONO MC . . . . . 0.1 mV/10 ohms
PHONO MM . . . . . 2.3 mV/50K ohms/100 pF
TUNER, AUX, PLAY 1, 2 . . . . . 150 mV/50K ohms

Output level/Impedance

OUTPUT . . . . . IV (rated output)/600 ohms 18V (maximum output)
REC 1, REC 2 . . . . . 150 mV/600 ohms
PHONES (8 ohms) . . . . . 600 mV (at output IV)/15 ohms 650 mV (maximum output)
(headphone impedance from 8 ohms to 16 ohms)

Equivalent input noise level
(IHF, A network)

PHONO MC . . . . . −157 dB (V) (47 ohms terminated)
PHONO MM . . . . . −136 dB (V) (closed circuit)
TUNER, AUX, PLAY 1, 2 . . . . . −126 dB (V) (closed circuit)

Signal to noise ratio
(IHF, A network, at rated output)

PHONO MC . . . . . 77 dB (47 ohms terminated)
PHONO MM . . . . . 84 dB (closed circuit)
TUNER, AUX, PLAY 1, 2 . . . . . 110 dB (closed circuit)

Signal to noise ratio (DIN)

PHONO MC . . . . . 72 dB (47 ohms terminated)
PHONO MM . . . . . 73 dB (2.2K ohms terminated)
TUNER, AUX, PLAY 1, 2 . . . . . 106 dB (closed circuit) 92 dB (47K ohms/250 pF terminated)

Total harmonic distortion
(at rated output attenuator −20 dB from 20 Hz to 20 kHz)

PHONO MC 0.005%
PHONO MM 0.003%
TUNER, AUX, PLAY 1, 2 . . . . . 0.002%

Channel separation

PHONO MC, MM . . . . . Crosstalk is less than noise level at 1 kHz 80 dB at 20 kHz
TUNER, PLAY 1, 2 . . . . . Crosstalk is less than noise level at 1 kHz 100 dB at 20 kHz

Frequency response

PHONO MC, MM . . . . . ±0.2 dB from 20 Hz to 20 kHz (RIAA STD)
TUNER, PLAY 1, 2 . . . . . +0 −0.5 dB from 10 Hz to 100 kHz

Tone control

BASS . . . . . ±10 dB at 100 Hz
TREBLE . . . . . ±10 dB at 10 kHz

Subsonic filter . . . . . 18 Hz (−6 dB/oct)

Phono overload level
(at 1 kHz with 0.1% THD)

PHONO MC . . . . . 12 mV
PHONO MM . . . . . 290 mV

Power consumption 20W

Dimensions . . . . . 425(W) x 170(H) x 204(D) mm (16-3/4 x 6-3/4 x 8")

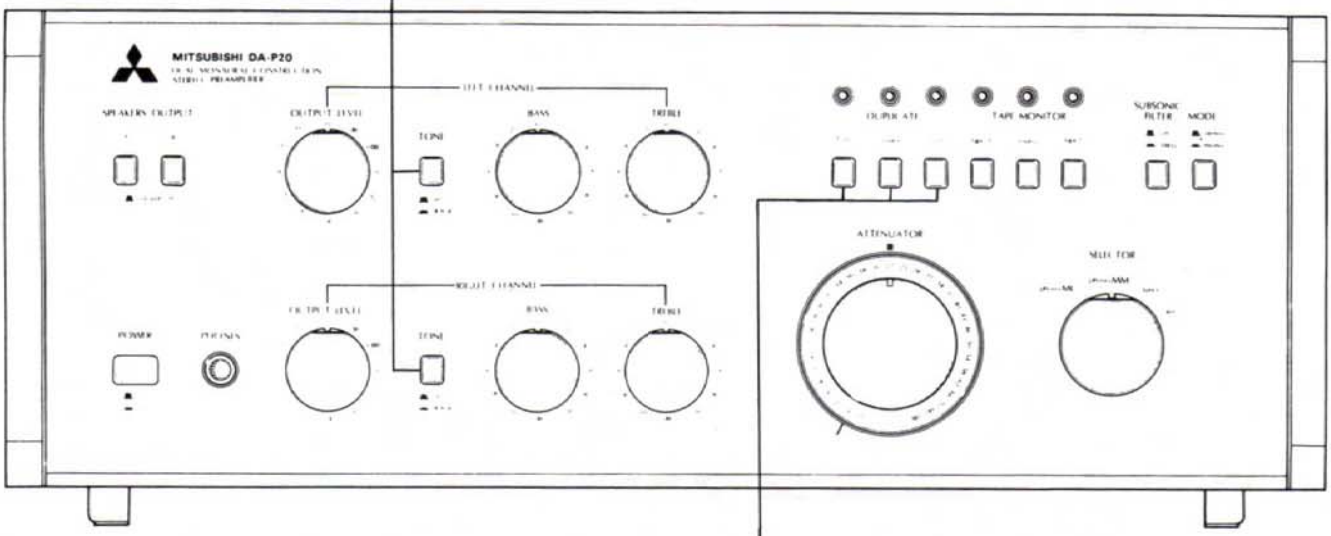
Weight . . . . . 5.3 kg (11-2/3 lb)

Design and specifications are subject to change without notice for improvements.

DESCRIPTION AND FUNCTION OF EACH PART

FRONT PANEL

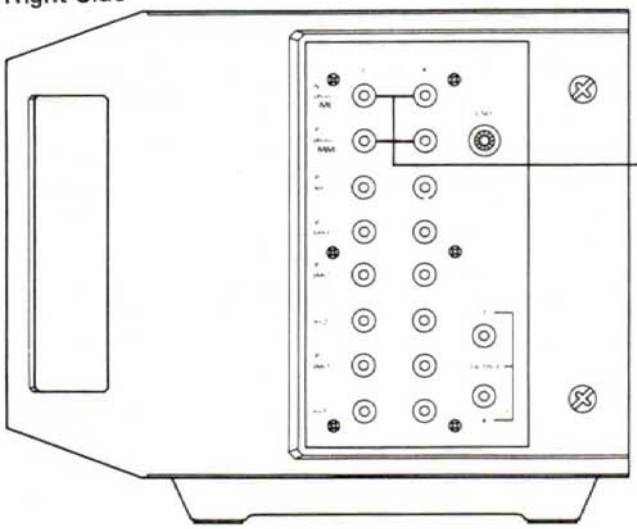
TONE (R & L) (Tone Defeat switches)
This switch is used for cancelling the TREBLE and BASS controls on the right and left channels.
ON: Both TREBLE and BASS controls can be adjusted.
DEFEAT: In this position, TREBLE and BASS controls are removed from the signal path and a flat frequency response is obtained.



DUPLICATE (Duplicate Switches)
This switch is used for duplicating from tape to tape.
While duplicating, normal listening to the program source set by the program SELECTOR switch is possible since the duplicate function operates independently.
1 – 2: For duplicating from the tape deck connected to PLAY 1 inputs to the tape deck connected to REC 2 outputs.
SOURCE: In this position, you can record the program source set by the program SELECTOR switch with the tape decks connected to the REC 1 and 2 outputs.
2 – 1: For duplicating from the tape deck connected to PLAY 2 inputs to the tape deck connected to REC 1 outputs.

• **SIDE PANEL**

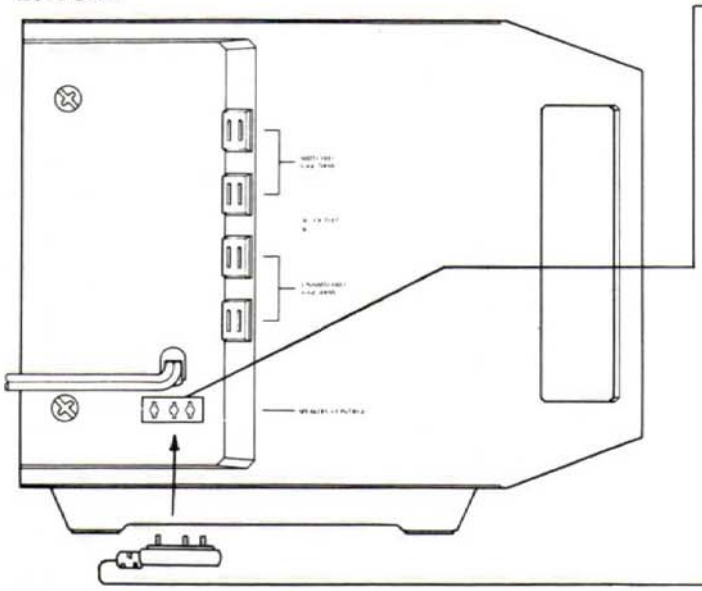
Right Side



PHONO MC (Phono Inputs for MC Cartridge)
The input impedance of phono MC is 10 ohms. The output leads from a turntable equipped with a MC cartridge are connected here.

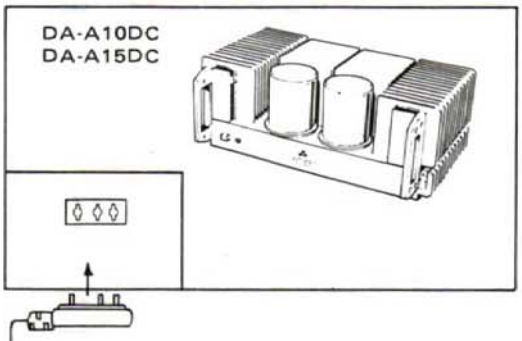
PHONO MM (Phono Inputs for MM Cartridge)
The input impedance of phono MM is 50K ohms. The output leads from a turntable equipped with a MM cartridge are connected here.

Left Side



SPEAKERS CONTROL
(Speaker Control Output Terminal)

When using a companion power amplifier (DA-A10DC, DA-A15DC), this terminal is connected to the "remote" terminal on the power amplifier by means of the "speaker control cable" supplied with the power amplifier. This allows control of the speakers from the front panel of this unit.



DISASSEMBLY

1. Disassebling the Top Cover

1) Remove the screw attached to the top cover. (Refer to Fig. 1)
2) Remove the top cover in arrowed direction by sliding.

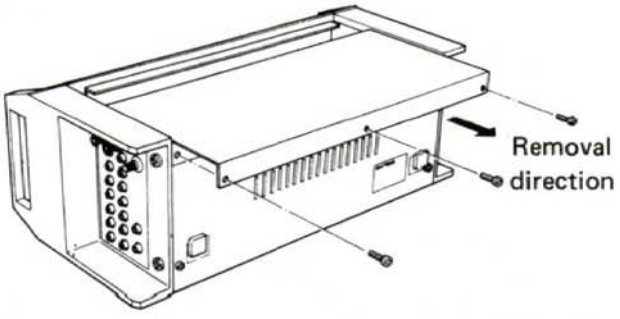


Figure 1.

2. Disassembling the Back Cover

1) Remove the top cover as described in Item 1.
2) Remove the screws attached to the back cover. (Refer to Fig. 2).
3) Remove the back cover in arrowed direction by sliding.

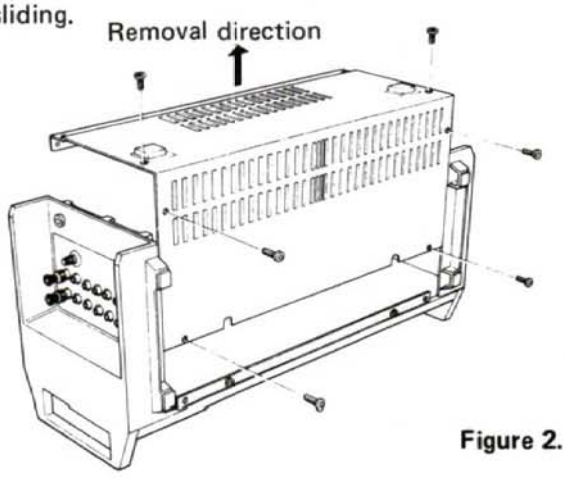


Figure 2.

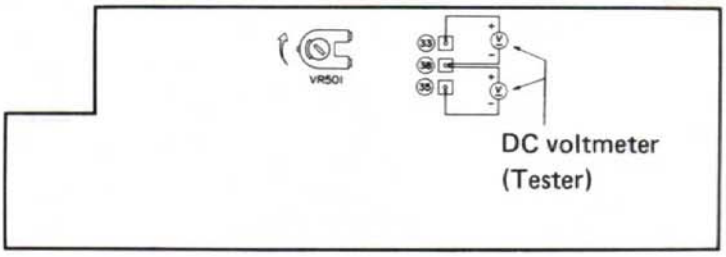
SERVICING NOTES

1. **Before connection, turn off the power supply at all times.**
   Otherwise, the speakers are liables to be damaged by click noise caused when the cord is plugged in or out.
2. **Avoid improper connection**
   When turntable, tuner, and R and L of output terminals of this machine are incorrectly connected or short-circuited, stable sound production cannot be achieved.
3. **Correctly make input terminal connection**
   When pin plug or earth wire of record player output cord is loosely connected or disconnected, hum occurs. Note that the speaker is liable to be damaged when such incorrect connection is not remedied.
4. **Use shielded wire for input terminal connection**
   Use a shielded wire of not more than 2m long for connections to record player and tuner. In this case, avoid the use of longer shielded wire which causes deterioration of high band characteristics and easy catching of hum and noise.
5. **Use the machine with a pin plug for short-circuitting use in PHONO terminal unused.**
   This is intended to prevent open noise, and click caused when the input selector is switched without connecting a turntable. When you use Mitsubishi DA-A10DC or DA-A15DC in combination with this machine, power of the power amplifier must be supplied from3 WITCHED plug sockets of this machine. The speaker control cord is used for only Mitsubishi power amplifiers.

ADJUSTMENT

1. Printed Circuit Board (PA-63)

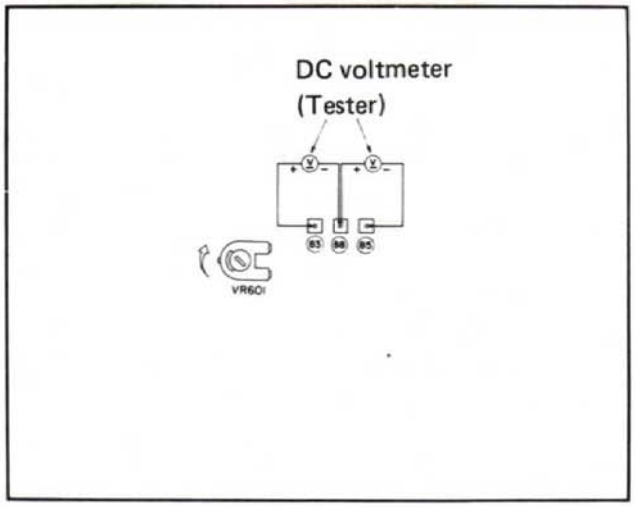
1) Set the semi-fixed resistor VA501 completely in the counterclockwise direction.
2) Set the power switch to ON position.
3) Connect the voltmeter to the ground terminal (38) and the terminal (33) on +B side and turn the VR501 clockwise (in the arrow direction) to adjust it so that it may indicate 33 +0.5(V).
4) Connect the voltmeter to the ground terminal (38) and the terminal (35) on - B side and confirm that it indicates –33 ±1.5(V).



The side where the parts of the printed circuit board (PA-63) are inserted.

2. Printed Circuit Board (PA-64)

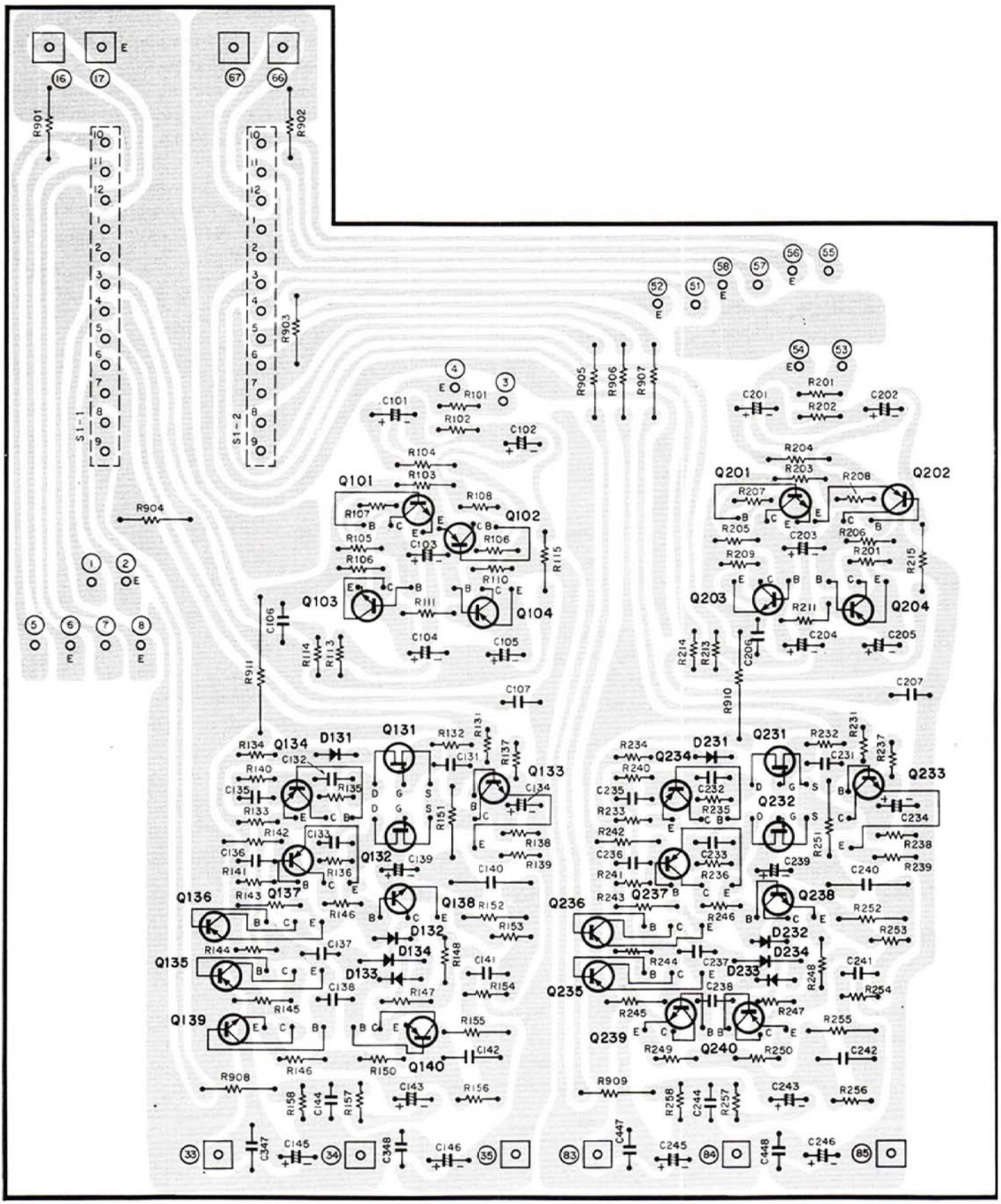
1) Set the semi-fixed resistor VR601 completely in the counterclockwise direction.
2) Set the power switch to ON position.
3) Connect the voltmeter to the ground terminal (88) and the terminal (83) on +B side and turn the VR601 clockwise (in the arrow direction) to adjust it so that it may indicate 33 +0.5 (V).
4) Connect the voltmeter to the ground terminal (88) and the terminal (85) on –B side and confirm that it indicates –33 ±1.5(V).



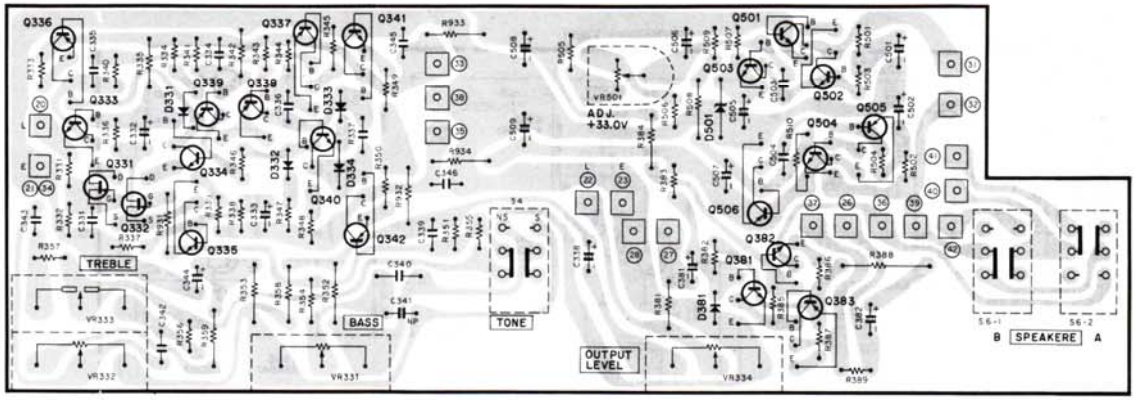
The side where the parts of the printed circuit board (PA-64) are inserted.

PRINTED CIRCUIT BOARD

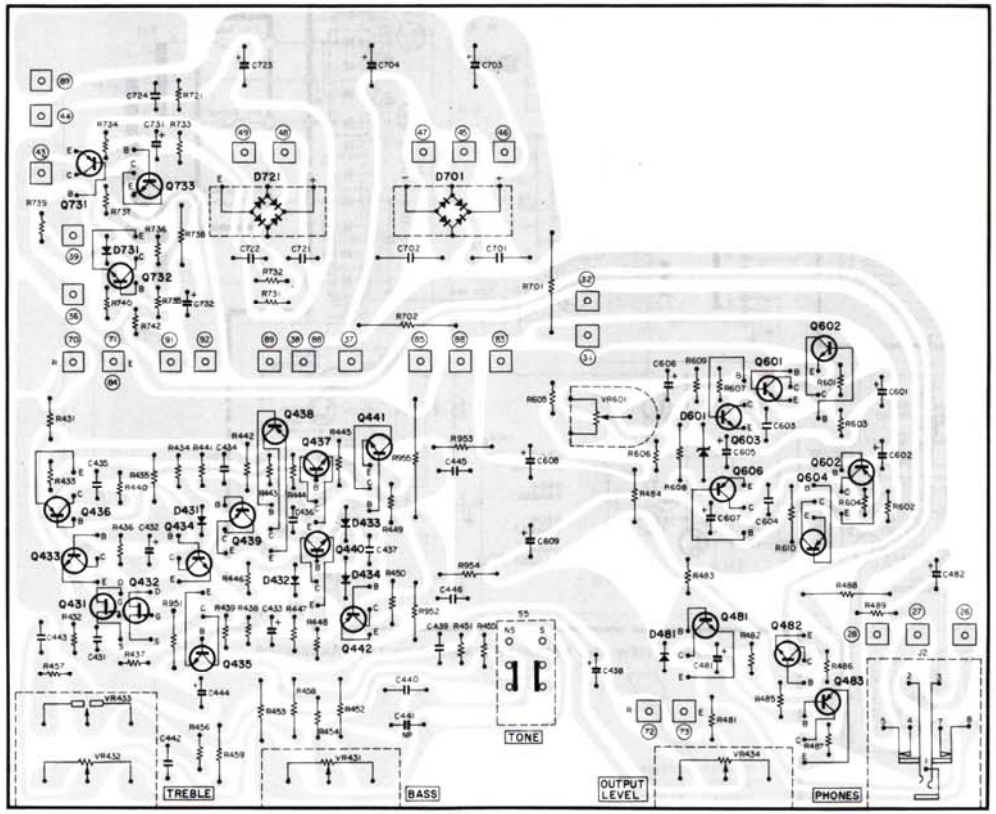
P.C.B PA-62



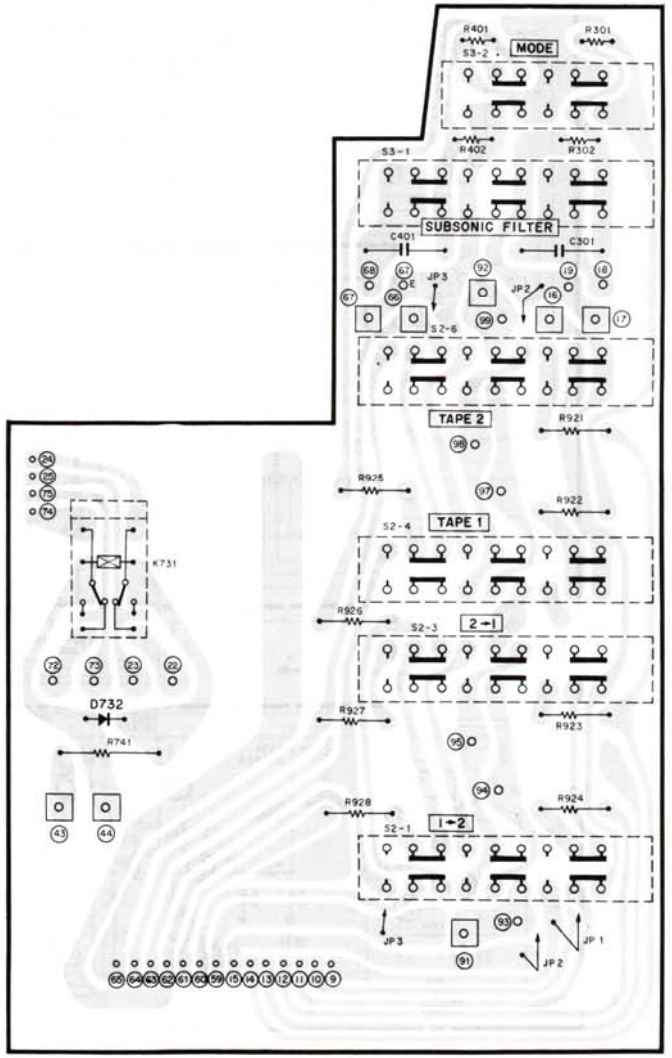
P.C.B PA-63



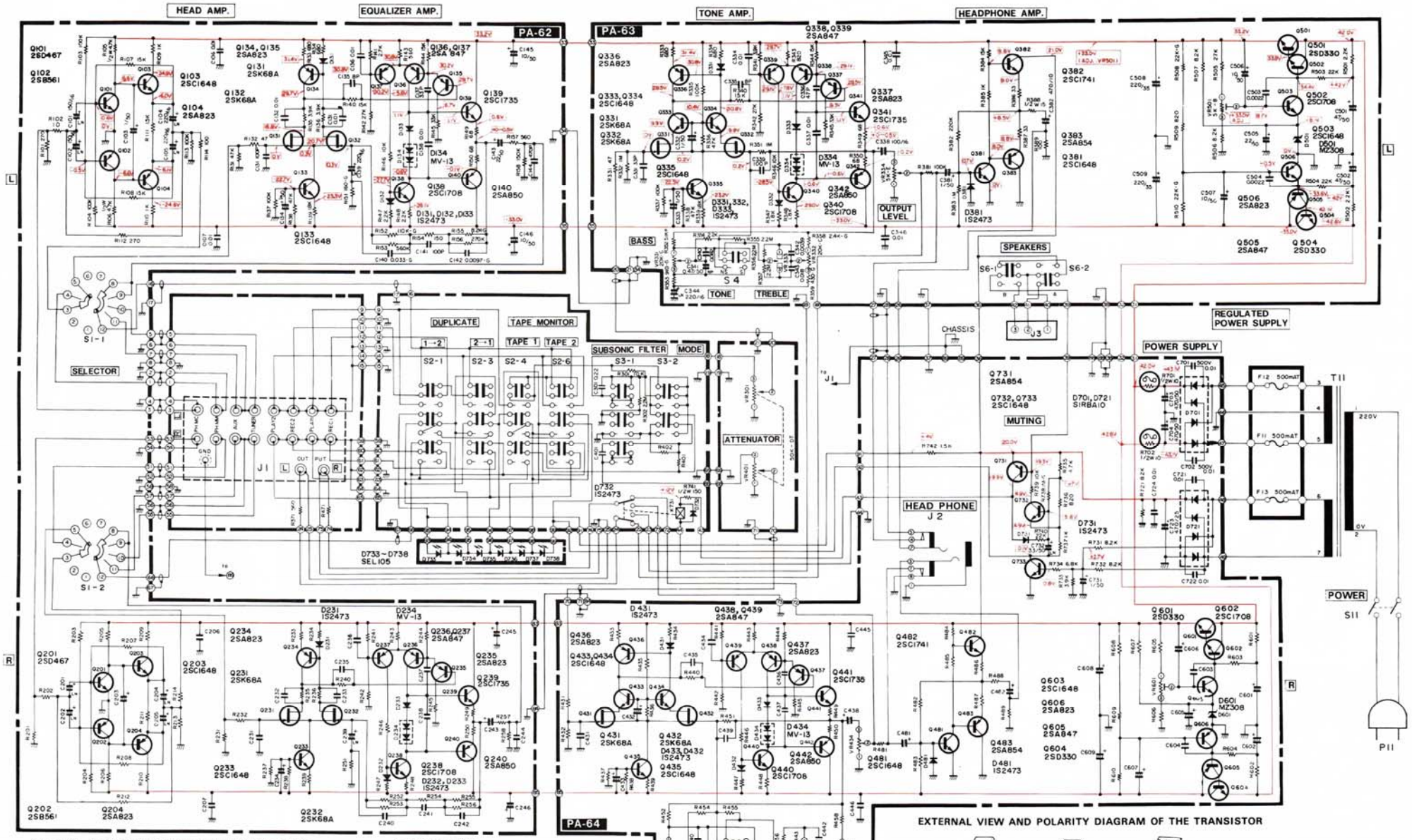
P.C.B PA-64



P.C.B PA-62



SCHEMATIC DIAGRAM

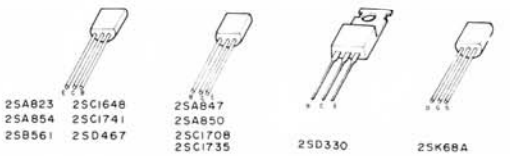


Note : 1. S1 SELECTOR Switch ..... phonoMC Position
S2 DUPLICATE, TAPE MONITOR Switch ..... source Position
S3-1 SUBSONIC FILTER Switch ..... off Position
S3-2 MODE Switch ..... mono Position
S4 TONE Switch ..... on Position
S5 TONE Switch ..... on Position
S6 SPEAKERS/OUTPUT Switch ..... A Position

2. Unit of C and R
(1) C ..... non-symbol μF
P symbol pF
(2) R ..... non-symbol Ω
K symbol KΩ

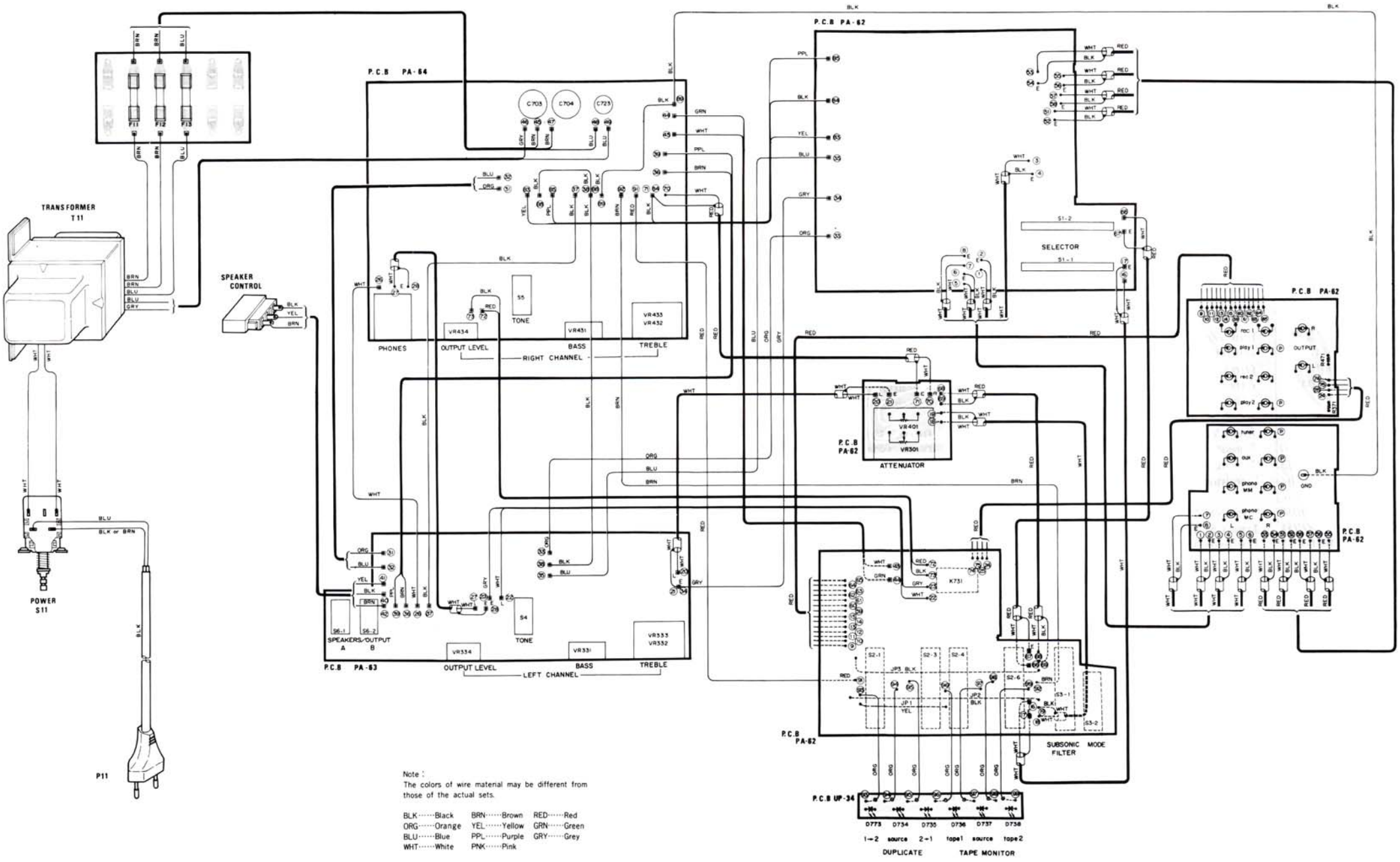
3. The voltage in eath section is the value measured by the DC 20KΩ/V tester

EXTERNAL VIEW AND POLARITY DIAGRAM OF THE TRANSISTOR



This circuit is a basic circuit diagram and is subject to change without notice for improvements.

WIRING


TRANSFORMER T11
SPEAKER CONTROL
POWER S11
P11
P.C.B PA-64
P.C.B PA-62
P.C.B PA-63
P.C.B UP-34
PHONES
OUTPUT LEVEL
TONE
BASS
TREBLE
RIGHT CHANNEL
LEFT CHANNEL
SELECTOR
ATTENUATOR
SUBSONIC MODE FILTER
SPEAKERS/OUTPUT A B
DUPLICATE
TAPE MONITOR
1→2 source 2→1 tape1 source tape2
Note :
The colors of wire material may be different from those of the actual sets.
BLK·····Black BRN·····Brown RED·····Red
ORG·····Orange YEL·····Yellow GRN·····Green
BLU·····Blue PPL·····Purple GRY·····Grey
WHT·····White PNK·····Pink

PARTS LIST

Symbol No.	Part No.	Description
Q101	M07215303	Transistor, 2SD467
Q102	M07215304	Transistor, 2SB561
Q103	M05104310	Transistor, 2SC1648
Q104	M05104312	Transistor, 2SA823
Q131	M07139304	Transistor, 2SK68A
Q132	M07139304	Transistor, 2SK68A
Q133	M05104310	Transistor, 2SC1648
Q134	M05104312	Transistor, 2SA823
Q135	M05104312	Transistor, 2SA823
Q136	M07140303	Transistor, 2SA847
Q137	M07140303	Transistor, 2SA847
Q138	M07113310	Transistor, 2SC1708
Q139	M07128303	Transistor, 2SC1735
Q140	M07133304	Transistor, 2SA850
Q201	M07215303	Transistor, 2SD467
Q202	M07215304	Transistor, 2SB561
Q203	M05104310	Transistor, 2SC1648
Q231	M07139304	Transistor, 2SK68A
Q232	M07139304	Transistor, 2SK68A
Q233	M05104310	Transistor, 2SC1648
Q234	M05104312	Transistor, 2SA823
Q235	M05104312	Transistor, 2SA823
Q236	M07140303	Transistor, 2SA847
Q237	M07140303	Transistor, 2SA847
Q238	M07113310	Transistor, 2SC1708
Q239	M07128303	Transistor, 2SC1735
Q240	M07133304	Transistor, 2SA850
Q331	M07139304	Transistor, 2SK68A
Q332	M07139304	Transistor, 2SK68A
Q333	M05104310	Transistor, 2SC1648
Q334	M05104310	Transistor, 2SC1648
Q335	M05104310	Transistor, 2SC1648
Q336	M05104312	Transistor, 2SA823
Q337	M05104312	Transistor, 2SA823
Q338	M07140303	Transistor, 2SA847
Q339	M07140303	Transistor, 2SA847
Q340	M07113310	Transistor, 2SC1708
Q341	M07128303	Transistor, 2SC1735
Q382	M07141303	Transistor, 2SC1741
Q383	M07137308	Transistor, 2SA854
Q431	M07139304	Transistor, 2SK68A
Q432	M07139304	Transistor, 2SK68A
Q433	M05104310	Transistor, 2SC1648
Q434	M05104310	Transistor, 2SC1648
Q435	M05104310	Transistor, 2SC1648

Symbol No.	Part No.	Description
Q436	M05104312	Transistor, 2SA823
Q437	M05104312	Transistor, 2SA823
Q438	M07140303	Transistor, 2SA847
Q439	M07140303	Transistor, 2SA847
Q440	M07113310	Transistor, 2SC1708
Q441	M07128303	Transistor, 2SC1735
Q442	M07133304	Transistor, 2SA850
Q482	M07141303	Transistor, 2SC1741
Q483	M07137308	Transistor, 2SA854
Q501	M07061304	Transistor, 2SD330
Q502	M07113310	Transistor, 2SC1708
Q503	M05104310	Transistor, 2SC1648
Q504	M07061304	Transistor, 2SD330
Q601	M07061304	Transistor, 2SD330
Q602	M07113310	Transistor, 2SC1708
Q603	M05104310	Transistor, 2SC1648
Q604	M07061304	Transistor, 2SD330
Q605	M07140303	Transistor, 2SA847
Q606	M05104312	Transistor, 2SA823
Q731	M07137308	Transistor, 2SA854
Q732	M05104310	Transistor, 2SC1648
Q733	M05104310	Transistor, 2SC1648
D131	M07060320	Diode, 1S2473
D132	M07060320	Diode, 1S2473
D133	M07060320	Diode, 1S2473
D134	M04091331	Varistor, MV-13
D231	M07060320	Diode, 1S2473
D232	M07060320	Diode, 1S2473
D233	M07060320	Diode, 1S2473
D234	M04091331	Varistor, MV-13
D331	M07060320	Diode, 1S2473
D332	M07060320	Diode, 1S2473
D333	M07060320	Diode, 1S2473
D334	M04091331	Varistor, MV-13
D381	M07060320	Diode, 1S2473
D431	M07060320	Diode, 1S2473
D432	M07060320	Diode, 1S2473
D433	M07060320	Diode, 1S2473
D434	M04091331	Varistor, MV-13
D481	M07060320	Diode, 1S2473
D501	M07133322	Diode, MZ308
D601	M07133322	Diode, MZ308

Symbol No.	Part No.	Description
D701	M07151320	Diode, SIRBA10
D721	M07151320	Diode, SIRBA10
D731	M07060320	Diode, 1S2473
D732	M07060320	Diode, 1S2473
D733	M07141320	Diode, SEL104R
D735	M07141320	Diode, SEL104R
D736	M07141320	Diode, SEL104R
D737	M07141320	Diode, SEL104R
D738	M07141320	Diode, SEL104R
T11	M07322549	Transformer, Power
F11	M07337490	Fuse-500 mA-SEMKO
F12	M07337490	Fuse-500 mA-SEMKO
F13	M07337490	Fuse-500 mA-SEMKO
R701	M07133420	R-Fuse ½ W 10 J
R702	M07133420	R-Fuse ½ W 10 J
K731	M07215465	Relay
J 2	M07230475	Jack (Head Phone)
J11	M07139480	Socket
J12	M07139480	Socket
J13	M07139480	Socket
J14	M07139480	Socket
S 1	M07291452	SW-Rotary (Selector)
S 2	M07215454	SW-Push (Tape Monitor, Duplicate)
S 3	M07291453	SW-Push (Mode, Subsonic Filter)
S 4	M07291450	SW-Push (Tone)
S 5	M07291450	SW-Push (Tone)
S 6	M07291451	SW-Push (Tone)
S11	M05113430	SW-Push (Power)

Symbol No.	Part No.	Description
VR301	M07215403	VR-W-DT50K25 (Attenuator)
VR331	M07215401	VR-STD-C20K25 (Bass)
VR332	M07215402	VR-W-C20K25 (Treble)
VR334	M07215400	VR-STD-ESK25 (Output Level)
VR401	M07215403	VR-W-DT50K25 (Attenuator)
VR431	M07215401	VR-STDC20K25 (Bass)
VR432	M07215402	VR-W-C20K25 (Treble)
VR434	M07215400	VR-STD-ESK25 (Output Level)
	M07291210	Knob (Attenuator)
	M07139211	Knob (Output Level, Bass, Treble)
	M07139210	Knob (Selector)

MITSUBISHI ELECTRIC CORPORATION
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